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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/502,052	01/07/2005	Xavier Fanton	255861US0PCT	2511

22850 7590 07/01/2008

OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
BRAYTON, JOHN JOSEPH	

ART UNIT	PAPER NUMBER
1795	

NOTIFICATION DATE	DELIVERY MODE
07/01/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)	
	10/502,052	FANTON ET AL.	
	Examiner	Art Unit	
	JOHN BRAYTON	4132	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 July 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/30/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 6 is objected to because of the following informalities: "the atomic percentage of the minority element is less than 500." It assumed that Applicant intended this to read 50%, not 500, as recited in the Applicant's disclosure on page 3, line 35. Appropriate correction is required.

2. Claims 18 and 19 are objected to because of the following informalities: As amended these claims appear to be identical. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 recites the limitation "wherein x is strictly less than 1" in line 2. There is insufficient antecedent basis for this limitation in the claim. It is recommended the Applicant designate what is meant by the 'X'. Examiner takes the position that 'X' means NiO_x.

5. Claim 22 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 22 provides for the use of the electrochemical device, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 22 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd.* v. *Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claim 1 and 3 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Iida (4,961,979).

Regarding claim 1, The Examiner takes the position that the language "an essentially ceramic target for a sputtering device" is an intended use and as such is not given patentable weight.

Iida is directed to an optical recording medium of oxygen deficient nickel oxide using a target of nickel oxide to sputter a nickel oxide layer. Iida teaches a target

comprised predominantly of nickel oxide, and a layer comprising predominantly nickel oxide, wherein the nickel oxide is oxygen-deficient with respect to the stoichiometric composition (col. 6, ln. 48-57). Since the deposited layer is oxygen deficient one skilled in the art would expect the target to have the same oxygen deficient property.

Regarding claim 3 Iida also teaches x is strictly less than one (col. 6, ln. 48-57).

Regarding claim 15, Iida teaches a thin layer based on nickel oxide by sputtering a ceramic target (col. 6, ln. 48-57).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iida in view of Takao (US 4,107,019 as cited in IDS), assuming the oxygen deficiency is not inherent in the target of Iida.

Regarding claim 1, Iida teaches a target of predominantly nickel oxide, but does not explicitly teach a target that is oxygen deficient with respect to stoichiometric composition (col. 6, ln. 48-57).

Takao teaches a sputtering target comprised of nickel and nickel oxide powders (col. 8, ln. 25-30). Such a target would be inherently oxygen deficient with respect to the stoichiometric ratio due to the combination of nickel powder with nickel oxide powder. This is the same method of forming the target as that of the instant invention.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the target of Iida with nickel powder, as taught by Takao, because one skilled in the art would have determined it thru experimentation.

Regarding claim 2, Iida teaches a target comprised predominantly of NiO, but does not explicitly teach a target formed from an intimate blend of nickel oxide powders and nickel powders.

Takao teaches a target formed from nickel powder and nickel oxide powder (col. 8, ln. 25-30). The combination of nickel and nickel oxide powders in a target would render the target oxygen deficient with respect to the stoichiometric composition.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the target of Iida by forming it from nickel and nickel oxide powder, as taught by Takao, because it would allow deposition of a NiOx layer over a wide composition range (col. 4, ln. 3-5 of Iida).

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iida as applied to claim 1 above, and further in view of Fujii et al (US 5,483,067).

Regarding claim 4, the Applicant is directed above for a complete discussion of Iida. Iida teaches a nickel oxide target, but does not explicitly teach a target having an electrical resistivity of less than 10 ohm.cm.

Fujii teaches a nickel oxide layer with a resistivity of 0.45 ohm.cm (col. 23, ln. 23-24).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the target of Iida by forming a nickel oxide target with a resistivity of 0.45 ohm.cm, as taught by Fujii, because it would allow the target to conduct electricity with a reduced drive voltage.

The Examiner takes the position that the language "an essentially ceramic target for a sputtering device" is an intended use and as such is not given patentable weight.

12. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iida and Takao as applied to claim 1 above, and further in view of Arai et al (US 5,981,092 as cited in IDS).

Regarding claims 5 and 6, Applicant is referred above for a complete discussion of Iida. Neither Iida nor Takao explicitly teaches a minority element alloyed to nickel oxide.

Arai teaches a composite target (col. 3, ln. 66) comprised of predominantly of NiO (col. 4, ln. 38) with a minority element less than 50 atomic % (col. 4, ln. 43-67).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of Iida and Takao, wherein nickel oxide is alloyed

with a minority element less than 50 atomic %, as taught by Arai, because it would lower the resistivity and increase the quality of the film (col. 4, ln. 47-50).

13. Claims 7-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iida, Takao, and Arai as applied to claim 5 above, and further in view of Campet et al. (5,522,976).

Regarding claim 7 and 8, Applicant is directed above for a complete discussion of Iida, Arai and Takao. Neither reference teaches minority elements whose oxide is an electroactive material with anodic coloration. Nor does it teach minority elements of Co, Ir, Ru, or Rh. Iida as modified by Arai and Takao teaches a nickel oxide target alloyed with a minority element.

Campet is directed to target for cathode sputtering. It teaches a target compound of NiO alloyed with a minority element from the metals of groups I-VIII of the Periodic table, these groups include minority elements consisting of Co, Ir, Ru, or Rh (col. 2, ln. 30-36).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of Iida, Takao, and Arai by alloying with a minority element from the group of Co, Ir, Ru, or Rh, as taught by Campet, because it would allow these solid materials having the desired properties to be sputtered and form a high melting point target compound(col. 1, ln. 24-30).

Applicant discloses minority elements whose oxide is an electroactive material with anodic coloration, such as for example Co, Ir, Ru, and Rh or from those belonging to column one of the Periodic table (for example H, Li, K and Na)." (Applicant's

disclosure pg. 6, ln. 11-18). Since Iida as modified by Campet teaches a minority element from the group of Co, Ir, Ru, or Rh, the Examiner takes the position that an oxide of one of these minority elements is inherently an electroactive material of anodic coloration.

Regarding claims 9 and 10, Applicant is directed above for a complete discussion of Iida, Arai and Takao. Neither reference teaches minority elements whose oxide is an electroactive material with cathodic coloration. Nor does it teach minority elements of Mo, W, Re, Sn, In, Bi, or mixtures thereof. Iida as modified by Arai and Takao teaches a nickel oxide target alloyed with a minority element.

Campet is directed to target for cathode sputtering. It teaches a target compound of NiO alloyed with a minority element from the metals of groups I-VIII of the Periodic table, these groups include minority elements consisting of Mo, W, Re, Sn, In, Bi (col. 2, ln. 30-36).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of Iida, Takao, and Arai by alloying with a minority element from the group of Mo, W, Re, Sn, In, Bi as taught by Campet, because it would allow these solid materials having the desired properties to be sputtered and form a high melting point target compound(col. 1, ln. 24-30).

Applicant discloses "minority elements whose oxide is an electroactive material with cathodic coloration, chosen from the group of Mo, W, Re, Sn, In, Bi" (Applicant's disclosure pg. 6, ln. 19-24). Since Iida as modified by Campet teaches a minority element from the group of Mo, W, Re, Sn, In, Bi, the Examiner takes the position that an

oxide of one of these minority elements is inherently an electroactive material of cathodic coloration.

Regarding claims 11 and 12, Applicant is directed above for a complete discussion of Iida, Arai and Takao. Neither reference teaches minority elements selected from the elements belonging to column one of the periodic table. Iida as modified by Arai and Takao teaches a nickel oxide target alloyed with a minority element.

Campet is directed to a target for cathode sputtering. It teaches a target compound of NiO alloyed with a minority element from the metals of group I of the Periodic table. Group I includes minority elements of H, Li, K and Na (col. 2, ln. 30-36).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of Iida, Takao, and Arai by alloying with a minority element from Group I of the Periodic table, as taught by Campet, because it would allow these solid materials having the desired properties to be sputtered and form a high melting point target compound (col. 1, ln. 24-30).

Regarding claims 13 and 14, Applicant is directed above for a complete discussion of Iida, Arai and Takao. Neither reference teaches minority elements selected from the elements belonging to column one of the periodic table. Iida as modified by Arai and Takao teaches a nickel oxide target alloyed with a minority element.

Campet is directed to a target for cathode sputtering. It teaches a target compound of Ni alloyed with a minority element that is a metal or an alkaline earth or a

semiconductor. Campet also teaches a minority element selected from the group consisting of Ta, Zn, Zr, Al, Si, Sb, U, Be, Mg, Ca, V, or Y (col. 2, ln. 30-36).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of Iida, Takao, and Arai by alloying with a minority element from the group consisting of Ta, Zn, Zr, Al, Si, Sb, U, Be, Mg, Ca, V, or Y (col. 2, ln. 30-36), as taught by Campet, because it would allow these solid materials having the desired properties to be sputtered and form a high melting point target compound(col. 1, ln. 24-30).

Applicant discloses a minority element selected from the group consisting of Ta, Zn, Zr, Al, Si, Sb, U, Be, Mg, Ca, V, Y is a metal or an alkaline earth or a semiconductor, wherein the hydrated or hydroxylated oxide of which is protonically conductive (Applicant's disclosure pg. 6, ln. 25-30). Since Iida as modified by Campet teaches a minority element from the group of Ta, Zn, Zr, Al, Si, Sb, U, Be, Mg, Ca, V, or Y the Examiner takes the position that the hydrated or hydroxylated oxide of one of these minority elements would be protonically conductive.

14. Claims 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iida, Takao and Arai as applied to claims 1 and 15 above, and further in view of Hashimoto et al (US 5,831,760).

Regarding claim 16, Applicant is directed above for a complete discussion of Iida. Iida teaches a nickel oxide layer formed by sputtering a nickel oxide target. Nickel oxide is an electrochromic material that exhibits anodic coloration.

Hashimoto teaches an oxidative colored electrochromic layer comprised of nickel oxide (col. 4, ln. 37-49).

Regarding claim 17, Applicant is directed above for a complete discussion of Iida, Takao and Arai. Iida teaches a nickel oxide layer formed by sputtering a nickel oxide target. Neither Ida nor Takao or Arai teaches an electrochemical device comprising a substrate provided with a stack of functional layers.

Hashimoto teaches an electrochemical device comprising a substrate provided with a stack of functional layers (Figures 1-6, Abstract of Hashimoto), including a layer based on nickel oxide (col. ln. 37-49).

The Examiner takes the position that the recitation "capable of" performs a function and is not a positive limitation but only requires the ability to so perform. Therefore the language "capable of reversibly and simultaneously inserting ions of the H+, Li+, or OH- type and electrons" is not given patentable weight.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of Iida, Takao and Arai to provide an electrochemical device comprising a substrate provided with a stack of functional layers including a layer based on nickel oxide, as taught by Hashimoto, because it would provide a layer with good optical properties and repeated durability (col. 4, ln. 42-45 of Hashimoto)

Regarding claims 18 and 19, Applicant is directed above for a complete discussion of Iida, Takao and Arai. Iida teaches a nickel oxide layer formed by

sputtering a nickel oxide target. Neither Ida nor Takao or Arai teaches an electrochemical device comprising a substrate provided with a stack of functional layers.

Hashimoto teaches an electrochemical device comprising a substrate provided with a stack of functional layers (Figures 1-6, Abstract of Hashimoto), including a layer based on nickel oxide, said layer being alloyed with a minority element consisting of a material whose oxide is an electroactive material with anodic coloration (col. ln. 37-49).

The Examiner takes the position that the recitation "capable of" performs a function and is not a positive limitation but only requires the ability to so perform. Therefore the language "capable of reversibly and simultaneously inserting ions of the H+, Li+, or OH- type and electrons" is not given patentable weight.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of Iida, Takao and Arai, by providing an electrochemical device comprising a substrate provided with a stack of functional layers, including a layer based on nickel oxide, said layer being alloyed with a minority element consisting of a material whose oxide is an electroactive material with anodic coloration, as taught by Hashimoto, because it would provide a layer with good optical properties and repeated durability (col. 4, ln. 42-45 of Hashimoto)

The properties of the layer being an electrochemically active layer with a minority element consisting of a material whose oxide is an electroactive material with anodic coloration are inherent to a nickel oxide layer with a minority element consisting of Co, Ir Ru or Rh, as disclosed by Applicant on page 6, ln. 11-18.

15. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iida, Takao, and Arai as applied to claim 1 above, and further in view of IBM Technical Disclosure: Thermally Stable Thin Film Capacitor, February 1967.

Regarding claim 20, Applicant is directed above for a complete discussion of Iida, Takao and Arai. Iida teaches a nickel oxide layer formed by sputtering a nickel oxide target. Neither Ida nor Takao or Arai teaches an electrochemical device comprising a substrate provided with a stack of functional layers.

The IBM Technical Disclosure bulletin, February 1967 teaches an electrochemical device comprising at least one carrier substrate provided with a stack of functional layers, including at least one electrochemically active layer, capable of reversibly and simultaneously inserting ions, of the H.sup.+, Li.sup.+ or OH.sup.- type, and electrons, wherein said electrochemically 1 active layer is based on nickel oxide, said layer being alloyed with a minority element selected from the elements belonging to the column one of the Periodic Table, said layer being obtained from a target as claimed in claim 1.

16. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iida, Takao and Arai as applied to claim 1 above, and further in view of Van Der Sluis (US 5,905,590).

Regarding claim 21, Applicant is directed above for a complete discussion of Iida, Takao and Arai. Iida teaches a nickel oxide layer formed by sputtering a nickel oxide target. Neither Ida nor Takao or Arai teaches an electrochemical device comprising a substrate provided with a stack of functional layers.

Van Der Sluis teaches an electrochemical device comprising at least one carrier substrate (figure 1, 3) provided with a stack of functional layers (Figure 1; reference numbers 5, 7, 9, 11, 13) including at least one electrochemically active layer (col. 4, ln 4-30), capable of reversibly and simultaneously inserting ions, of the H.sup.+, Li.sup.+ or OH.sup.- type, and electrons, wherein said electrochemically active layer is a metal or an alkaline earth or a semiconductor, the hydrated or hydroxylated oxide of which is protonically conducted by sputtering (col. 4, ln. 25-26).

Since Van Der Sluis teaches a layer of a metal or an alkaline earth or a semiconductor, the properties of this layer wherein the hydrated or hydroxlyated oxide of the layer would be capable of protonically conducting are inherent. Therefore the hydrated or hydroxlyated oxide of the layer taught by Van Der Sluis would be capable of protonically conducting.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of Iida with an electrochemical device comprising at least one carrier substrate provided with a stack of functional layers, including at least one electrochemically active layer, capable of reversibly and simultaneously inserting ions, of the H.sup.+, Li.sup.+ or OH.sup.- type, and electrons, wherein said electrochemically active layer is a metal or an alkaline earth or a semiconductor, the hydrated or hydroxylated oxide of which is protonically conducted, as taught by Van Der Sluis, because it would allow use of solid state electrolytes therefore eliminating sealing problems and making the device easier to handle (col. 4, ln. 4-6).

17. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iida as applied to claim 17 above, and further in view of Ito el al (US 4,832,469).

Regarding claim 22, Ito teaches the use of the electrochemical device to form part of an electrochromic glazing, for buildings or for means of locomotion of the train, airplane or car type, to form part of display screens or to form part of electrochromic mirrors (Abstract of Ito).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of Iida to provide a electrochromic glazing, for buildings or for means of locomotion of the train, airplane or car type, to form part of display screens or to form part of electrochromic mirrors, as taught by Ito, because it would allow one to dim the window (Abstract of Ito).

Double Patenting

18. Claims 17-22 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-35 of U.S. Patent No. 6,277,523. Although the conflicting claims are not identical, they are not patentably distinct from each other because the Patent '523 includes and encompasses all the limitations of the instant claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN BRAYTON whose telephone number is (571)270-3084. The examiner can normally be reached on 7:30 a.m. - 5:00 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on (571) 272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. B./
Examiner, Art Unit 4132

/Jessica L. Ward/
Supervisory Patent Examiner, Art Unit 4132